What is claimed is:

1. A network management system comprising:

a plurality of communications apparatuses for performing communications through a network;

5   an equipment management apparatus, connected to at least one of the plurality of communications apparatuses through the network, for monitoring and controlling the at least one of the plurality of communications apparatuses; and

a directory apparatus for managing connection relations between the plurality of communications apparatuses and the equipment management apparatus,

10   wherein the equipment management apparatus includes a directory client for transmitting an obtaining request for obtaining a connection relation and receiving the connection relation corresponding to the obtaining request, and

the directory apparatus includes a directory information base for storing the connection relations and a directory server for receiving the obtaining request from the directory client,

15   searching the directory information base in order to detect the connection relation corresponding to the obtaining request, and transmitting the connection relation having been detected to the directory client.

2. The network management system of claim 1 further comprising:

20   a network management apparatus for managing the plurality of communications apparatuses and the equipment management apparatus and transmitting the obtaining request,

wherein the directory client receives the obtaining request from the network management apparatus, transmits the obtaining request to the directory server, receives the connection

25   relation corresponding to the obtaining request from the directory server, and transmits the connection relation having been received to the network management apparatus.

3. The network management system of claim 1,

wherein the equipment management apparatus includes a plurality of equipment

30   management apparatuses,

37

the directory information base stores connection relations between the plurality of equipment management apparatuses and the plurality of communications apparatuses, and

the directory client included in one of the plurality of equipment management apparatuses transmits the obtaining request, to the directory server, for obtaining a connection relation between another of the plurality of equipment management apparatuses and at least one of the plurality of communications apparatuses connected to the another of the plurality of equipment management apparatuses, and receives the connection relation corresponding to the obtaining request from the directory server.

4. The network management system of claim 1, wherein the directory apparatus includes an input unit for receiving an input relating to the connection relation, and the directory server inputs the connection relation received through the input unit and stores the connection relation in the directory information base.

5. The network management system of claim 1,

wherein the equipment management apparatus further comprises a relation register unit for inquiring a connection relation between the equipment management apparatus and the plurality of communications apparatuses, and transmitting an inquired connection relation to the directory server, and

the directory server receives the inquired connection relation from the relation register unit and stores a received connection relation in the directory information base.

6. The network management system of claim 4, wherein the directory apparatus further includes

a communications apparatus information table for storing a maximum number of the plurality of communications apparatuses which can be connected with the equipment management apparatus and a number of the plurality of communications apparatuses which are currently connected with the equipment management apparatus, and

a number control unit for defining the plurality of communications apparatuses to be connected with the equipment management apparatus, based on the maximum number of the

38

plurality of communications apparatuses which can be connected with the equipment management apparatus and the number of the plurality of communications apparatuses which are currently connected with the equipment management apparatus stored in the communications apparatus information table.

7. The network management system of claim 6,

wherein the directory information base further stores locations of the plurality of communications apparatuses, and

the directory apparatus further includes an area control unit for defining the plurality of communications apparatuses to be connected with the equipment management apparatus, based on the maximum number of the plurality of communications apparatuses which can be connected with the equipment management apparatus and the number of the plurality of communications apparatuses which are currently connected with the equipment management apparatus stored in the communications apparatus information table, and the locations stored in the directory information base.

8. The network management system of claim 4,

wherein the equipment management apparatus further includes a communications path control unit for inputting the connection relation received by the directory client and transmitting a request for establishing communications based on an input connection relation, to at least one of the plurality of communications apparatuses, and

each of the plurality of communications apparatuses further includes a communications agent for receiving the request for establishing communications from the communications path control unit, and establishing the communications with the equipment management apparatus based on a received request.

9. The network management system of claim 4,

wherein the directory information base further stores identification information, to be corresponding to each of the plurality of communications apparatuses, for identifying the each of the plurality of communications apparatuses,

39

the directory server detects identification information corresponding to at least one of the plurality of communications apparatuses optionally selected, in the directory information base, and

the equipment management apparatus further includes an identification control unit for transmitting a request for obtaining the identification information corresponding to the at least one of the plurality of communications apparatuses optionally selected to the directory server, receiving the identification information from the directory server, and identifying the at least one of the plurality of communications apparatuses optionally selected based on a received identification information.

10. The network management system of claim 2,

wherein the directory apparatus further includes an identification information base for storing identification information for identifying the network management apparatus,

the directory server detects the identification information corresponding to the network management apparatus from the identification information base, and

the directory client receives the obtaining request from the network management apparatus, transmits a request for obtaining the identification information corresponding to the network management apparatus to the directory server, receives the identification information from the directory server, and identifies the network management apparatus based on the identification information having been received.

11. The network management system of claim 3,

wherein each of the plurality of equipment management apparatuses includes a load monitor unit for monitoring a load state of the each of the plurality of equipment management apparatuses, and

the directory apparatus further includes a load control unit for collecting load states from the load monitor unit included in the each of the plurality of equipment management apparatuses and managing the plurality of communications apparatuses connected to the plurality of equipment management apparatuses, based on the load states having been collected.

40

12. The network management system of claim 11,

wherein each of the plurality of equipment management apparatuses further includes a warning generation unit for generating a warning when the load state monitored by the load monitor unit is over a predefined threshold.

13. The network management system of claim 3, wherein the directory apparatus includes an input unit for receiving an input relating to the connection relation, and the directory server inputs the connection relation received through the input unit and stores the connection relation in the directory information base.

14. The network management system of claim 13, wherein the directory apparatus further includes

a communications apparatus information table for storing a maximum number of the plurality of communications apparatuses which can be connected with one of the plurality of equipment management apparatuses and a number of the plurality of communications apparatuses which are currently connected with the one of the plurality of equipment management apparatuses, and

a number control unit for defining the plurality of communications apparatuses to be connected with the one of the plurality of equipment management apparatuses, based on the maximum number of the plurality of communications apparatuses which can be connected with the one of the plurality of equipment management apparatuses and the number of the plurality of communications apparatuses which are currently connected with the one of the plurality of equipment management apparatuses stored in the communications apparatus information table.

15. The network management system of claim 13,

wherein each of the plurality of equipment management apparatuses further includes a communications path control unit for inputting the connection relation received by the directory client and transmitting a request for establishing communications based on an input

41

connection relation, to at least one of the plurality of communications apparatuses, and

each of the plurality of communications apparatuses further includes a communications agent for receiving the request for establishing communications from the communications path control unit, and establishing the communications with one of the plurality of equipment management apparatuses based on a received request.

16. The network management system of claim 3,

wherein each of the plurality of equipment management apparatuses further comprises a relation register unit for inquiring a connection relation between the plurality of equipment management apparatuses and the plurality of communications apparatuses, and transmitting an inquired connection relation to the directory server, and

the directory server receives the inquired connection relation from the relation register unit and stores a received connection relation in the directory information base.

17. The network management system of claim 1,

wherein the equipment management apparatus includes a load monitor unit for monitoring a load state of the equipment management apparatus, and

the directory apparatus further includes a load control unit for obtaining the load state from the load monitor unit included in the equipment management apparatus and managing the plurality of communications apparatuses connected to the equipment management apparatus, based on an obtained load state.

18. A directory apparatus comprising:

a directory information base for storing connection relations defining communications paths between a plurality of communications apparatuses and a plurality of equipment management apparatuses which monitor and control the plurality of communications apparatuses; and

a directory server for receiving an obtaining request for obtaining a connection relation, searching the directory information base in order to detect the connection relation corresponding to a received obtaining request, and transmitting a detected connection relation.

42

19. The directory apparatus of claim 18 further comprising an input unit for inputting the connection relation, wherein the directory server inputs the connection relation received through the input unit and stores the connection relation in the directory information base.

20. A network management method of a network system composed of a plurality of communications apparatuses, and a plurality of equipment management apparatuses, connected to the plurality of communications apparatuses through a network, for monitoring and controlling the plurality of communications apparatuses, the network management method comprising:

    storing connection relations for defining communications paths connecting the plurality of communications apparatuses and the plurality of equipment management apparatuses in a directory information base;

    receiving an obtaining request for obtaining a connection relation;

    detecting the connection relation corresponding to a received obtaining request by way of searching the directory information base; and

    transmitting a detected connection relation.